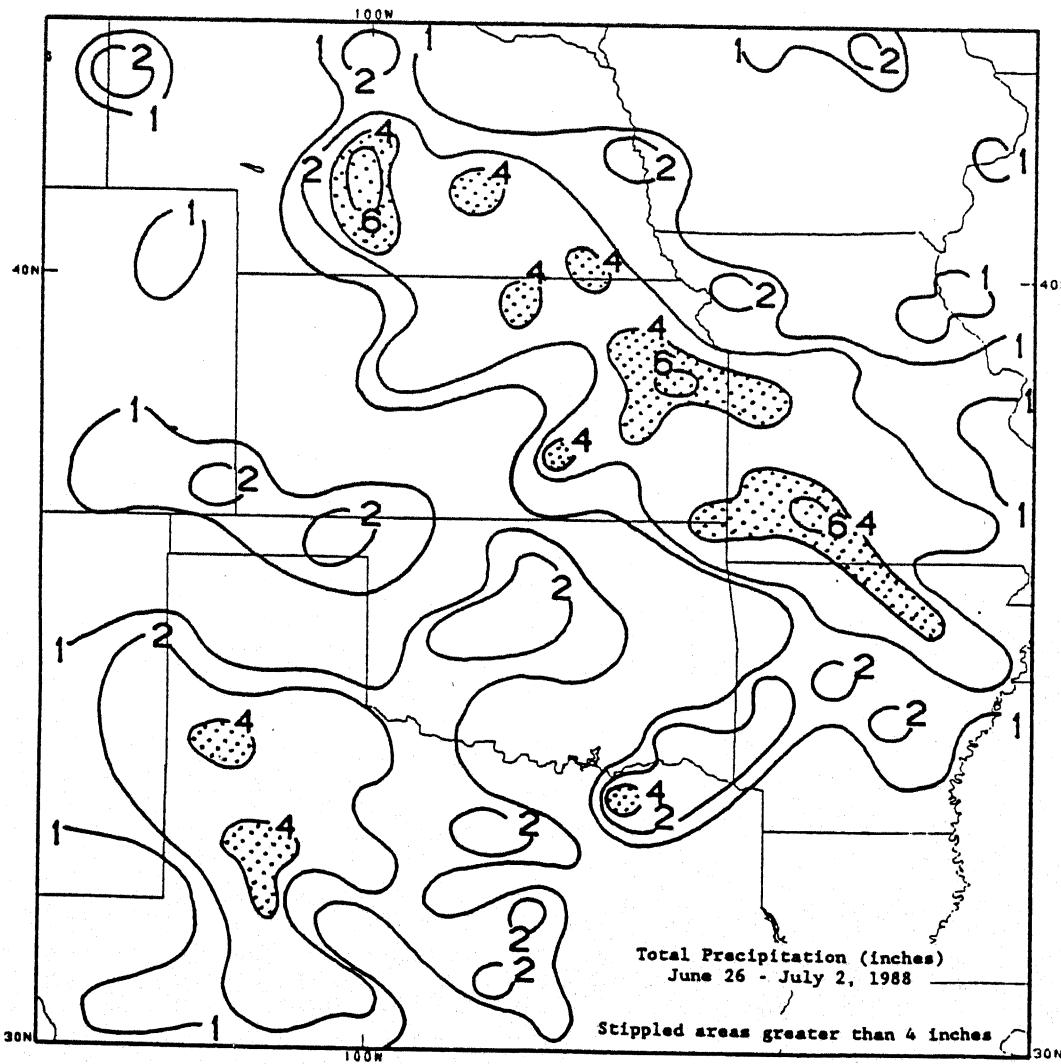


# WEEKLY CLIMATE BULLETIN

No. 88/27

Washington, DC

July 2, 1988



TORRENTIAL THUNDERSTORMS DROPPED UP TO 13.0 INCHES OF RAIN ON EAST-CENTRAL KANSAS LAST WEEK AS THE HEAVY PRECIPITATION BROUGHT TEMPORARY RELIEF TO THE DRYNESS IN PARTS OF THE GREAT PLAINS AND SOUTH, HOWEVER, MOST AREAS TO THE EAST FAILED TO RECEIVE ANY SIGNIFICANT RAINFALL AS RECORD DRYNESS PERSISTED IN THE NORTHERN GREAT PLAINS AND MIDWEST. FOR A HISTORICAL RANKING OF PRECIPITATION AND TEMPERATURES ACROSS THE U.S. SINCE 1930 FOR THIS JUNE AND THE APRIL-JUNE PERIOD, REFER TO THE SPECIAL CLIMATE SUMMARY.

## WEEKLY CLIMATE BULLETIN

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This Bulletin is issued weekly by the Climate Analysis Center and is designed to indicate, in a brief, concise format, current surface climatic conditions in the United States and around the world. The Bulletin contains:

Highlights of major global climatic events and anomalies.  
U.S. climatic conditions for the previous week.  
U.S. apparent temperatures (summer) or wind chill (winter).  
Global two-week temperature anomalies.  
Global four-week precipitation anomalies.  
Global monthly temperature and precipitation anomalies.  
Global three-month precipitation anomalies (once a month).  
Global twelve-month precipitation anomalies (every 3 months).  
Global temperature anomalies for winter and summer seasons.  
Special climate summaries, explanations, etc. (as appropriate).

Most analyses contained in this Bulletin are based on preliminary, unchecked data received at the Center via the Global Telecommunication System. Similar analyses based on final, checked data are likely to differ to some extent from those presented here.

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# GLOBAL HIGHLIGHTS

MAJOR CLIMATIC EVENTS AND ANOMALIES AS OF JULY 2, 1988  
(Approximate duration of anomalies is in brackets.)

1. United States and South Central Canada:

WARM, DRY CONDITIONS PERSIST.

Locally heavy rains, up to 167.4 mm (6.59 inches), fell at a few places in the central United States; however, most stations reported less than 19.5 mm (0.76 inch). Unusually warm conditions persisted in the north central states with temperatures as much as  $5.3^{\circ}\text{C}$  ( $9.5^{\circ}\text{F}$ ) above normal. See U.S. Weekly Weather Highlights and Special Climate Summary for additional details [16 weeks dry - 9 weeks warm].

2. Kazakh S.S.R.:

VERY WARM CONDITIONS PREVAIL.

Unusually high temperatures occurred across much of the Kazakh S.S.R. and adjacent Soviet Socialist Republics and were as much as  $6.8^{\circ}\text{C}$  ( $12.2^{\circ}\text{F}$ ) above normal [7 weeks].

3. Western India:

RAINS BRING MORE RELIEF.

As much as 109.7 mm (4.32 inches) of rain fell at stations in western India and brought more relief; however, rainfall amounts remained well below normal in extreme western India [7 weeks].

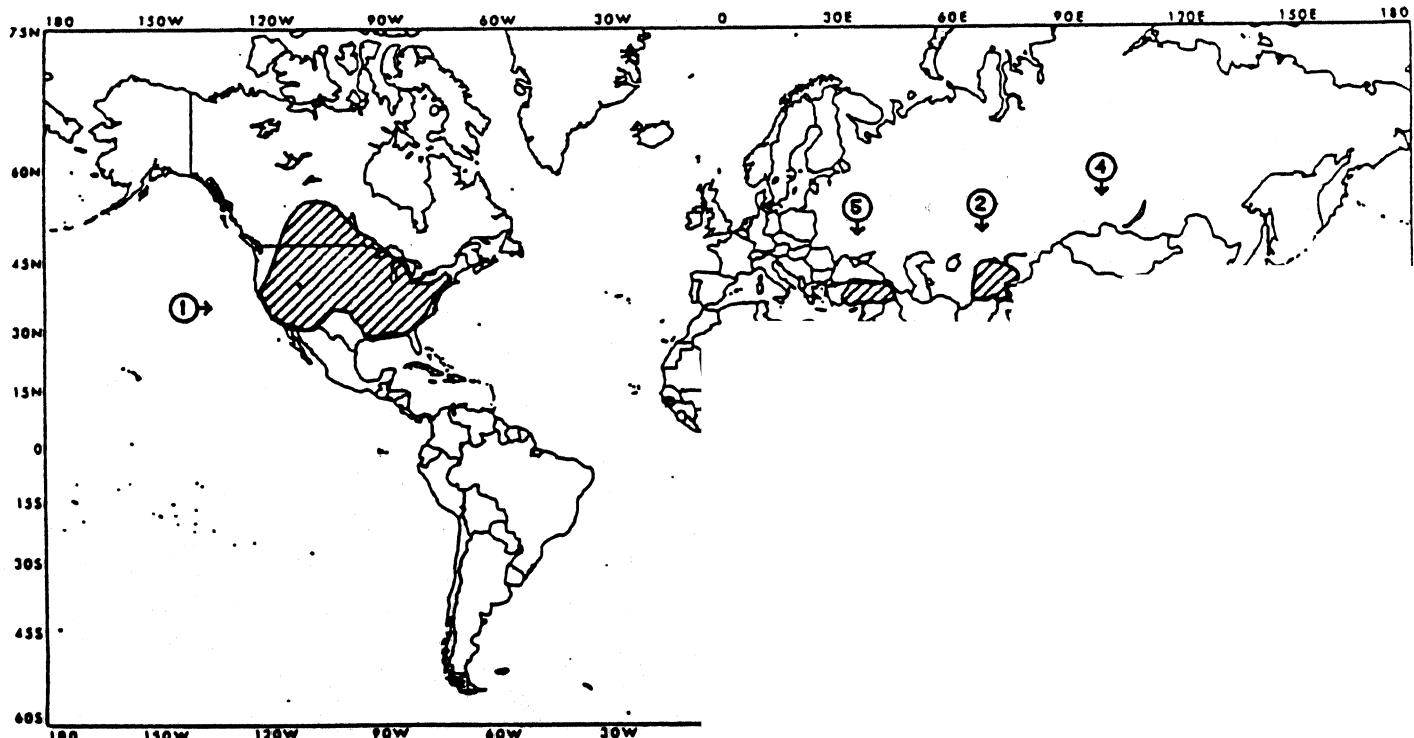
4. China:

LOCALLY HEAVY RAINS EASE DRYNESS IN SOME REGIONS. Little or no precipitation fell across much of China; however, locally heavy precipitation, up to 422.4 mm (16.56 inches), occurred at stations from Hainan Island northeastward to Shandong Province in east central China [5 weeks].

5. Turkey:

COOL, WET CONDITIONS DEVELOP.

Moderate to heavy precipitation, as much as 97.0 mm (3.82 inches), fell in south central Turkey. Temperatures were generally  $2.0^{\circ}\text{C}$  ( $3.6^{\circ}\text{F}$ ) to  $5.1^{\circ}\text{C}$  ( $9.2^{\circ}\text{F}$ ) below normal [3 weeks].



Approximate locations of the major anomalies on this map. See the other world maps in the issue for the anomalies, four-week precipitation anomalies, and other climatic highlights.

# U.S. WEEKLY WEATHER HIGHLIGHTS

FOR THE WEEK OF JUNE 26 THROUGH JULY 2, 1988

Thunderstorms brought welcome but sometimes excessive rainfall to portions of the Great Plains (from North Dakota southward into Texas), the central Mississippi Valley (Missouri and Arkansas), and the Southeast (Alabama, Florida, and the Carolinas) (see Table 1). According to the River Forecast Center, precipitation amounts (maximum totals in parentheses) were largest in the central parts of South Dakota (6.6 in) and Nebraska (10.0 in), eastern Kansas (13.0 in), southern Missouri (6.6 in), northern Arkansas (5.7 in), central Oklahoma (4.4 in), and western Texas (7.9 in) (see front cover). In the Southeast, thunderstorms dropped heavy amounts on sections of central Mississippi (4.0 in), southern Alabama (7.0 in), northwestern (9.3 in) and southeastern (5.0 in) Florida, eastern North Carolina (3.8 in), and central South Carolina (3.4 in) (see Figure 1). Farther north, much of northern New England measured over two inches of precipitation for the second consecutive week. Light to moderate amounts fell along the Pacific Northwest Coast and across most of the Rockies, Great Plains, upper Midwest, Southeast, and New England regions, however, totals generally averaged under 0.5 inches in the latter three areas. Little or no precipitation occurred in the normally dry parts of the Southwest, Great Basin, and Pacific Northwest interior, while unseasonably dry weather was found in much of Minnesota, from eastern Texas eastward to western Mississippi, in most of the Tennessee Valley, around the

central Great Lakes region, and from central Illinois eastward to New Jersey as sections of the East Coast have become unusually dry over the past 4-6 weeks. In addition, several stations in the Southeast, Midwest, and northern Great Plains have established record minimum precipitation totals for June and for the April-June period. Refer to the Special Climate Summary for further details.

Since April, temperatures across the northern portions of the Rockies and Great Plains have averaged well above normal. This week was no exception as departures in the area ranged between +6 to +9°F and extreme maximum values soared into the mid to upper one hundreds (108°F at Glasgow, MT on 6/26/88). Hot weather also spread into the Southeast as departures up to +6°F were located in Louisiana and southern Mississippi, where highs reached into the mid one hundreds (see Table 2). Elsewhere, slightly above normal temperatures were observed in the Southwest, the central Rockies, and in much of Alaska and Hawaii. In contrast, cooler conditions persisted in the southern and central Great Plains, the Midwest, and throughout the Atlantic Coast from Georgia northward into Maine as several eastern cities set daily record minimum temperatures during the last half of the week. Largest departures (between -8 to -13°F) were observed along the eastern Great Lakes and in New England (see Table 3).

TABLE 1. Selected stations with more than two and a half inches of precipitation for the week.

Springfield, MO	6.59	Cape Canaveral, FL	3.30
Cairns AFB, AL	5.83	Topeka, KS	3.17
Dothan, AL	5.12	Carlsbad, NM	3.14
West Plains, MO	4.93	Grand Island, NE	3.08
Homestead AFB, FL	4.26	Pensacola, FL	3.05
Bangor, ME	3.88	Joplin, MO	3.00
Cannon AFB, NM	3.64	Concordia, KS	2.95
Cherry Point NAS, NC	3.58	Memphis, TN	2.92
West Palm Beach, FL	3.56	North Omaha, NE	2.92
Oklahoma City, OK	3.51	North Platte, NE	2.65
Miami, FL	3.51	Montgomery, AL	2.65
Robert-Gray AFB, TX	3.47	Tucumcari, NM	2.63
Panama City, FL	3.36		

**WEEKLY WEATHER FEATURES**  
**WEEK ENDING JULY 2, 1988**

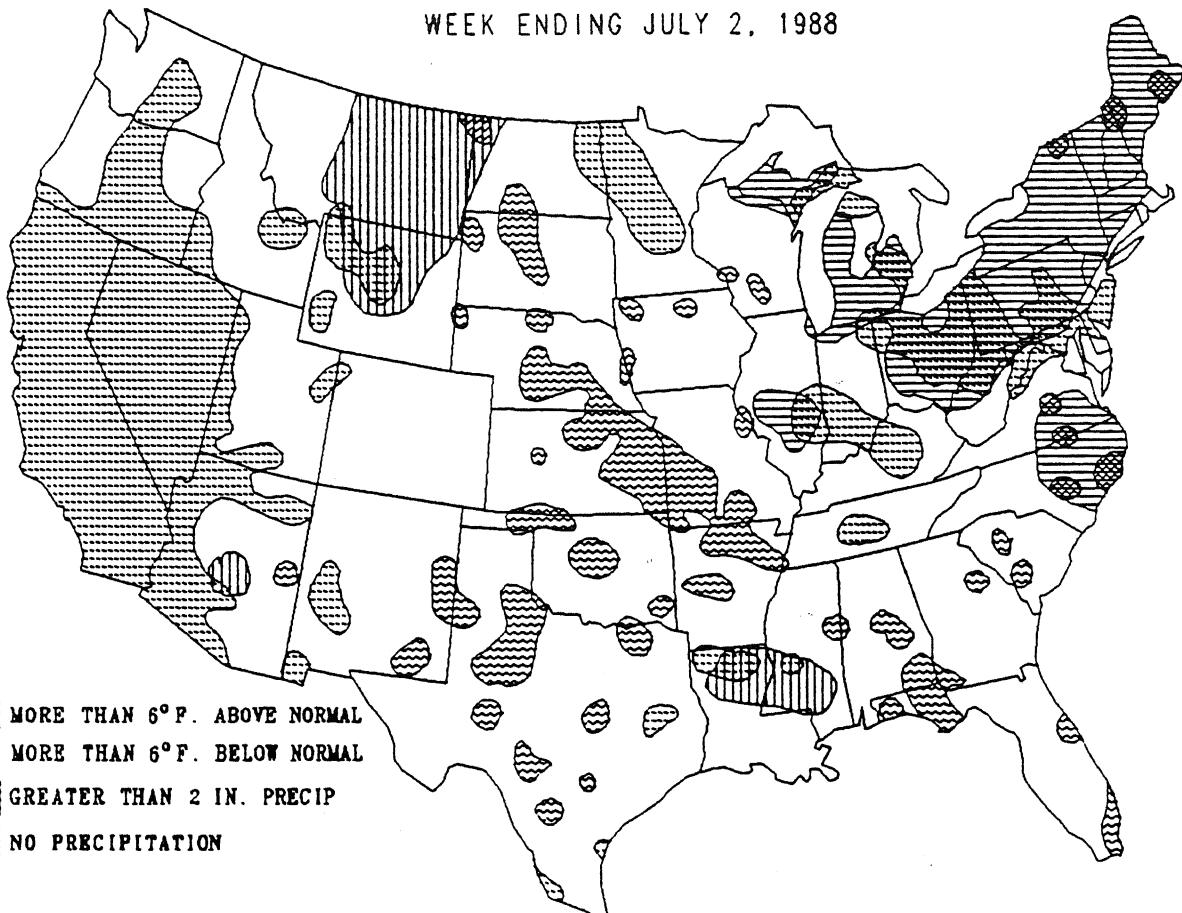


TABLE 2. Selected stations with temperatures averaging greater than  $5^{\circ}\text{F}$  ABOVE normal for the week.

Station	TDepNmL	AvgT( $^{\circ}\text{F}$ )	Station	TDepNmL	AvgT( $^{\circ}\text{F}$ )
Miles City, MT	+9	80	Shreveport, LA	+6	88
Worland, WY	+9	78	England AFB, LA	+6	88
Glasgow, MT	+9	77	Keesler AFB, MS	+6	88
Sheridan, WY	+9	75	Monroe, LA	+6	88
Billings, MT	+8	77	Fort Smith, AR	+6	87
Phoenix, AZ	+7	97	Casper, WY	+6	74
Jackson, MS	+7	88	Havre, MT		
Williston, ND	+7	75	Fairbank-		
Lander, WY	+7	74	Bozeman		
Luke AFB, AZ	+6	95			

TABLE 3. Selected stations with temperatures averaging less than  $5^{\circ}\text{F}$  BELOW normal for the week.

Station	TDepNmL	AvgT( $^{\circ}\text{F}$ )
Mt. Washington, NH	-13	35
Binghamton, NY	-11	57
Utica, NY	-11	57
Syracuse, NY	-11	59
Bradford, PA	-10	54
Montpelier, VT	-10	55
Burlington, VT	-10	58
Massena, NY	-10	58
Griffiss AFB, NY	-10	58
Rochester, NY	-10	60
Morgantown, WV	-10	62
Concord, NH	-9	59
Elkins, WV	-9	59
Glens Falls, NY	-9	59
Youngstown, OH	-9	60

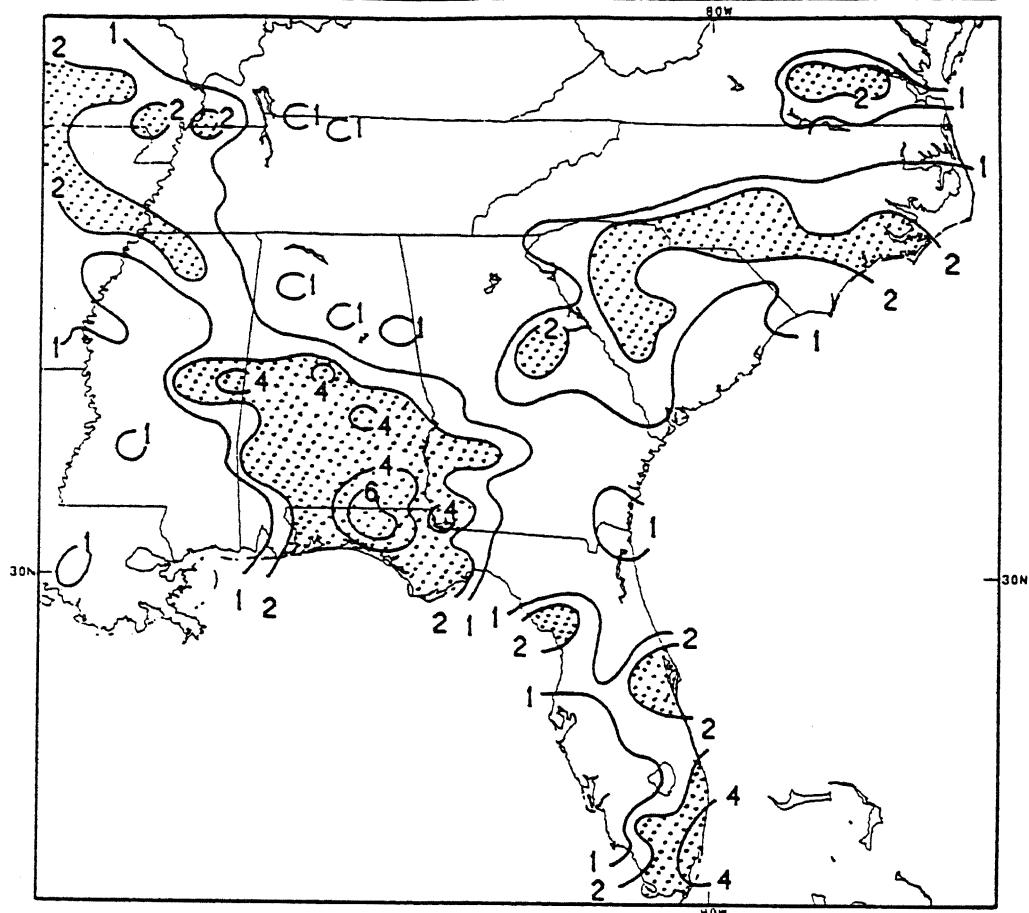
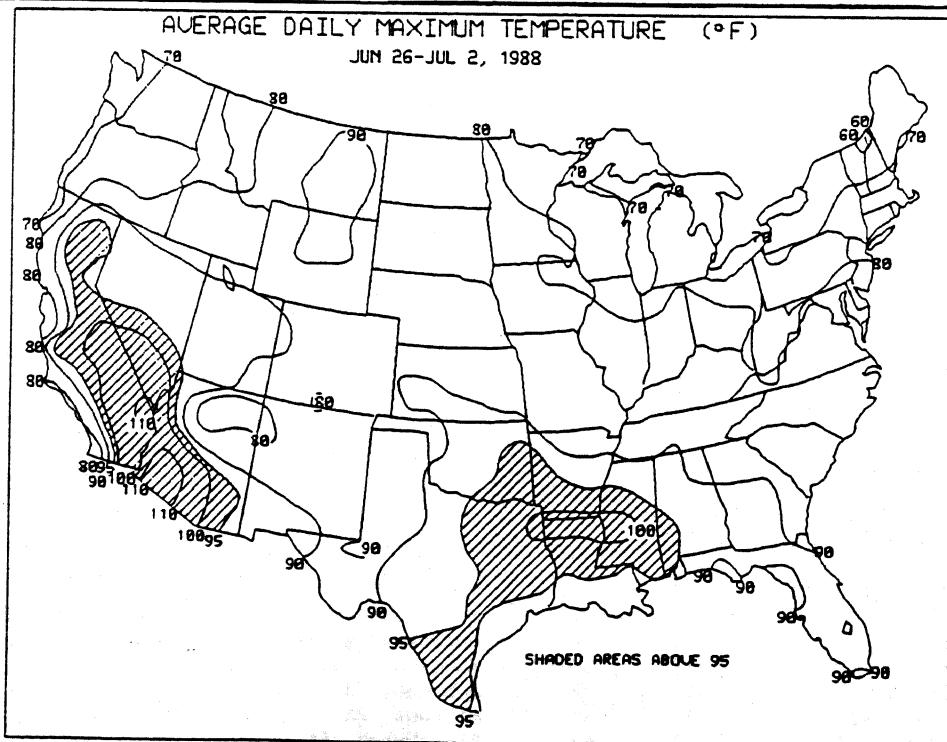
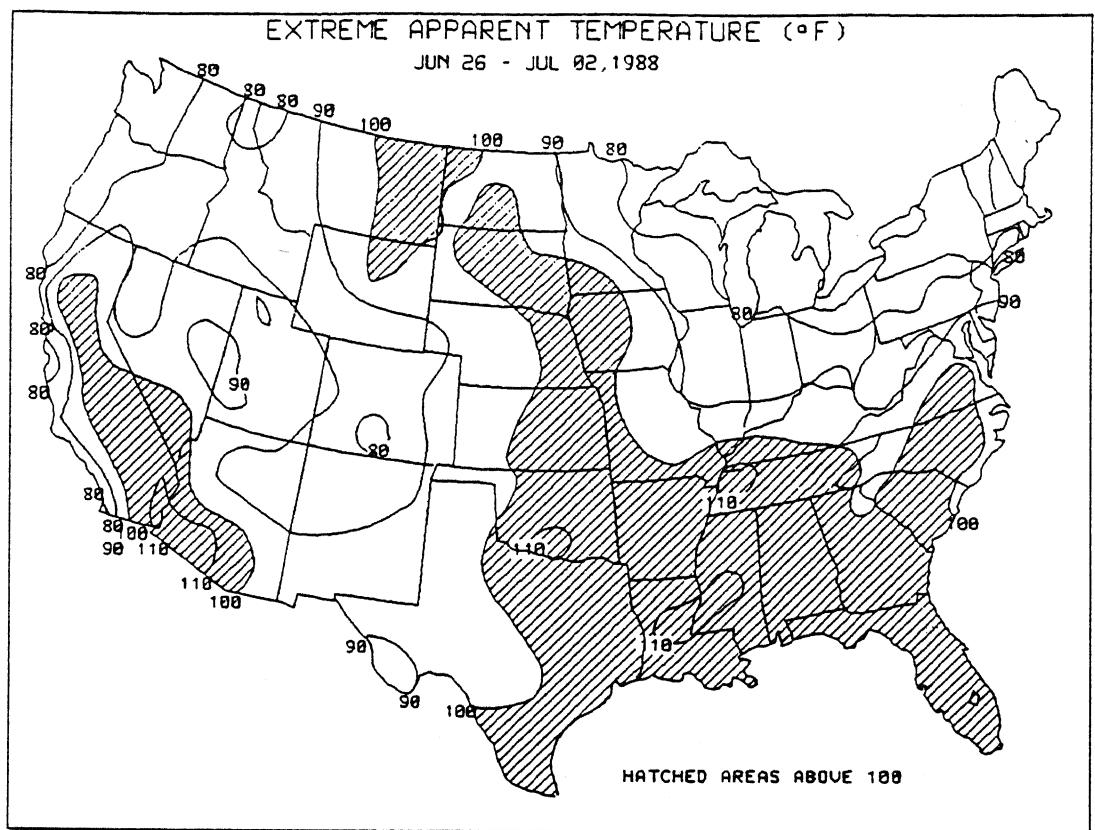


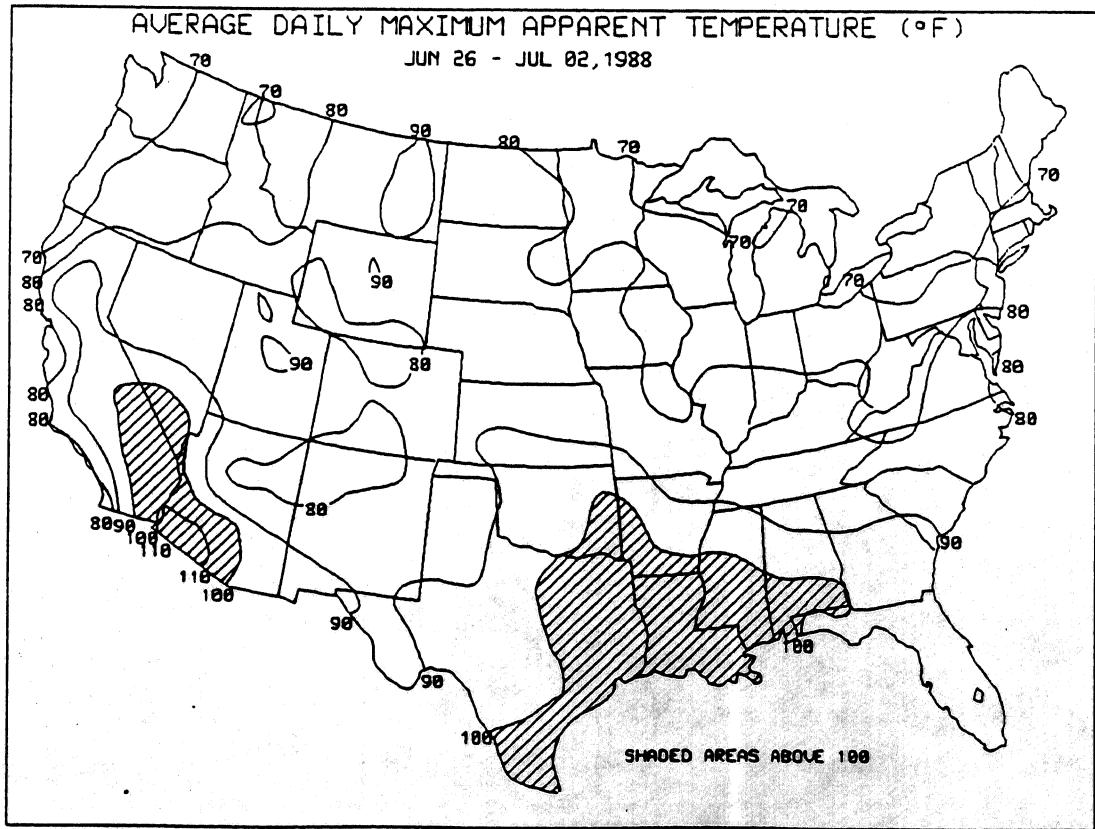
Figure 1. Total precipitation (inches) during June 26-July 2, 1988 with stippled areas greater than two inches. Up to 9.3 inches of rain fell across the panhandle of Florida, while 7.0 inches was reported in southern Alabama.

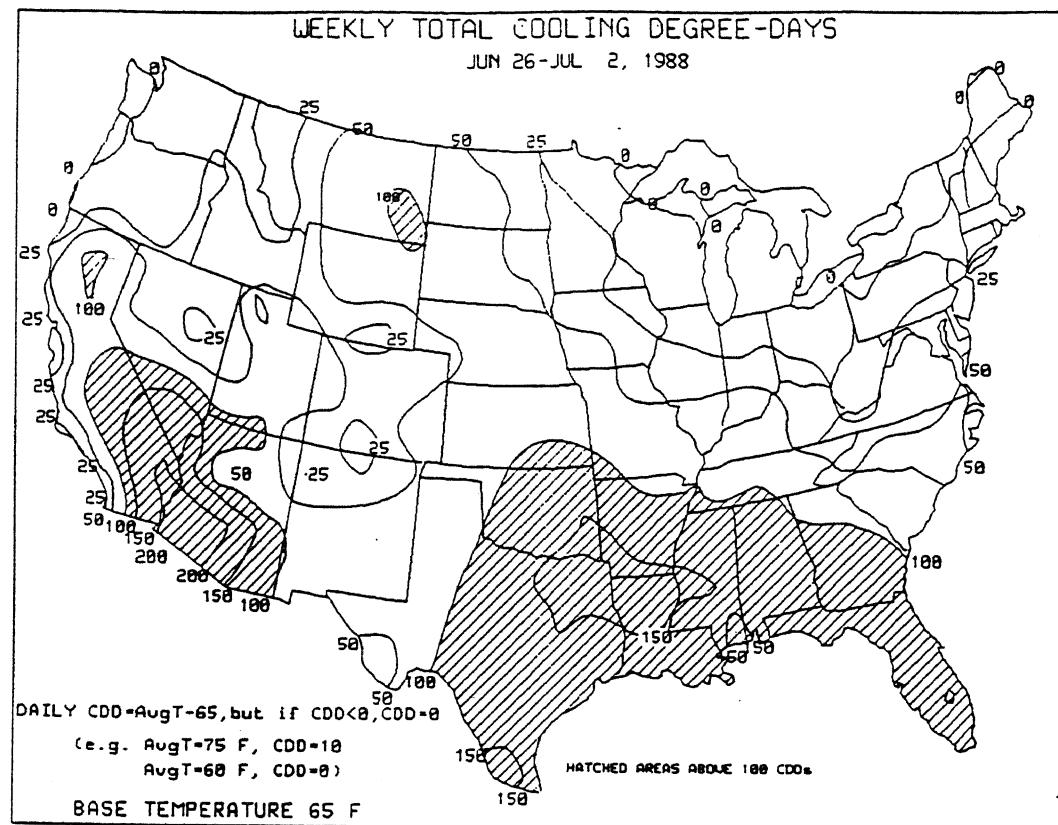


Holds AVERAGED over 100°F in parts of the Southeast, while the average maximum temperatures in the Great Plains and Midwest "cooled off" from last week's excessive values and only averaged in the eighties and low nineties.

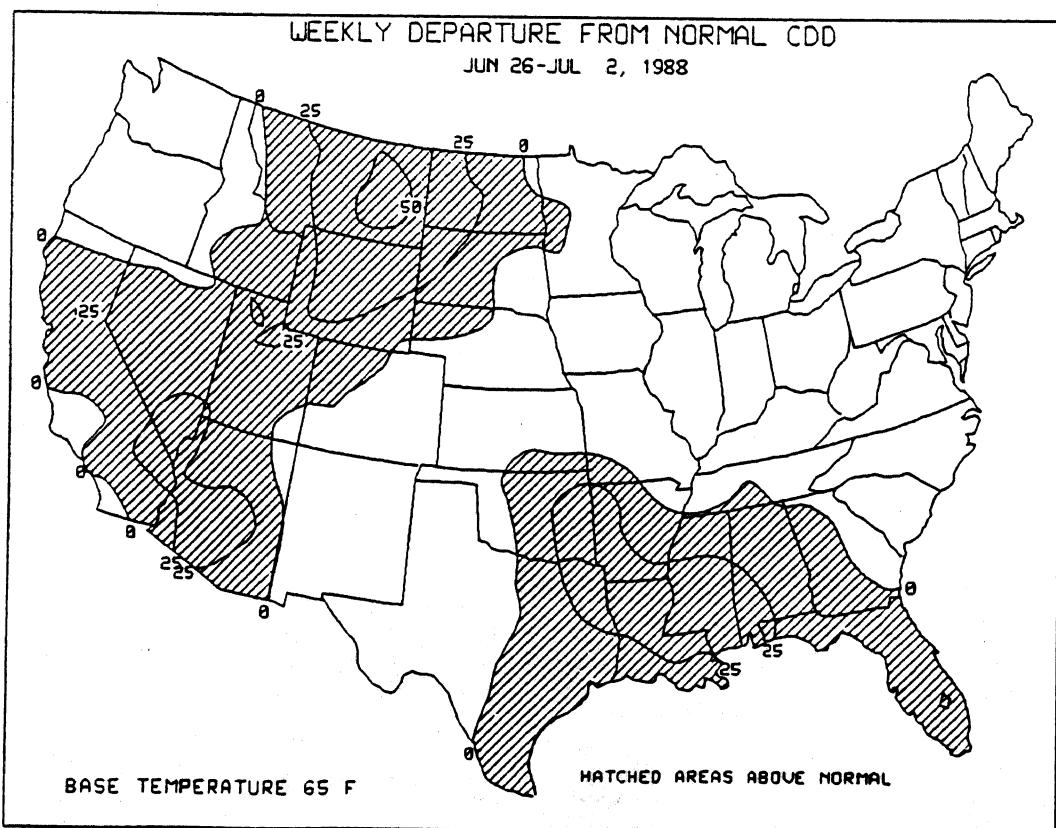


Apparent temperatures fell in the "dangerous" category ( $>105^{\circ}\text{F}$ ) at least once last week as hot weather covered the Southwest, Great Plains, and Southeast (above), while the Southwest and Southeast endured uncomfortable afternoon readings (below).



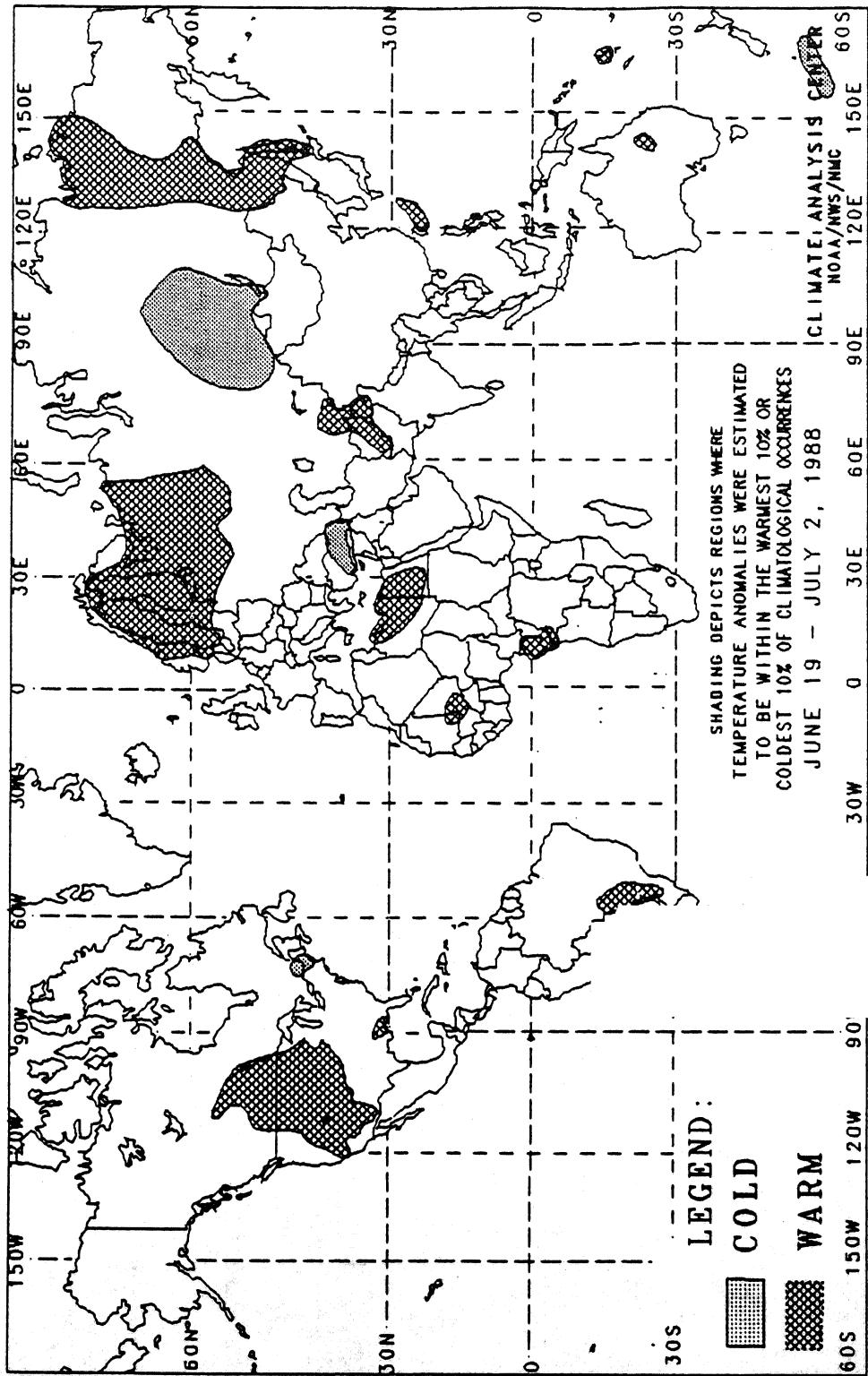


Above normal temperatures in the northern thirds of the Rockies and Great Plains and throughout the Southeast greatly increased the normal demand for air conditioning.



# GLOBAL TEMPERATURE ANOMALIES

2 week



The anomalies on this chart are based on observations from synoptic observing stations for which at least one synoptic observation was received from a twenty-four-hour basis so many not taken. As a result of these missing minimum temperature may have a warm bias resulted in an overestimation of the extent

Temperature anomalies are not depicted temperature departures from normal exceeds 1

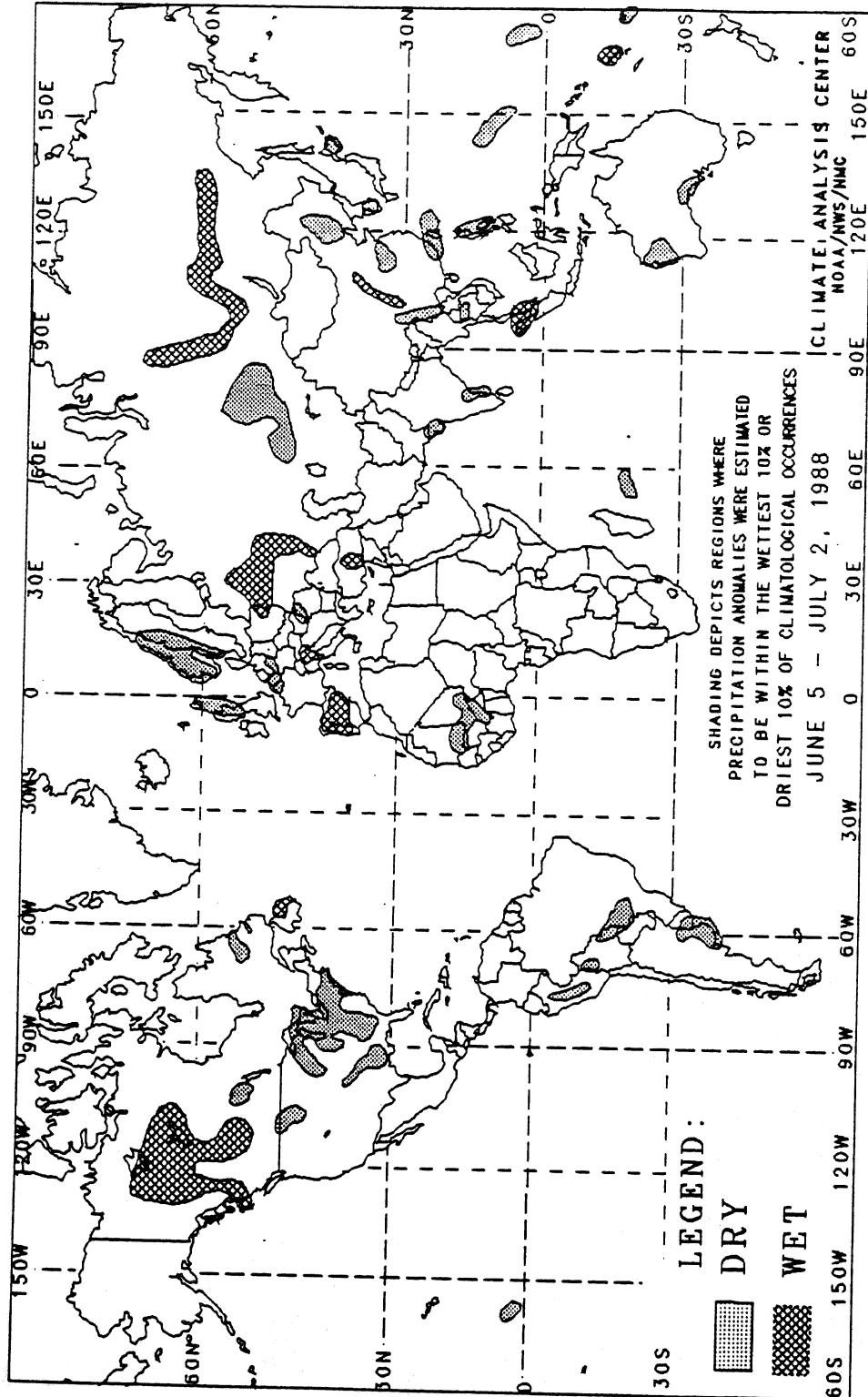
oximately 2500 of temperature stations do not observations are estimated to have a warm bias anomalies.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of two week temperature anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

# GLOBAL PRECIPITATION ANOMALIES

4 Week



The anomalies on this chart are based on approximately 2500 observing stations for which at least 27 days of precipitation observations (including zero amounts) were received or estimated from synoptic reports. As a result of both missing observations and the use of estimates from synoptic reports (which are conservative), a dry bias in the total precipitation amount may exist for some stations used in this analysis. This in turn may have resulted in an overestimation of the extent of some dry anomalies.

In climatologically arid regions where normal precipitation for the four week period is less than 20 mm, dry anomalies are not depicted. Additionally, wet anomalies for such arid regions are not depicted.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of four week precipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

# SPECIAL CLIMATE SUMMARY

Climate Analysis Center, NMC  
National Weather Service, NOAA

## HISTORICAL COMPARISONS OF THIS JUNE AND APRIL-JUNE PRECIPITATION AND TEMPERATURE RANKINGS SINCE 1930 (INCLUDING "DUST BOWL" YEARS) AND SINCE 1951 ("RECENT" HISTORY).

The following eight figures contain historical rankings based upon actual observed precipitation and temperature values since 1930 (to incorporate the "Dust Bowl" years of the 1930's) and since 1951 (to compare "recent" meteorological conditions and to include several new stations added after World War II). All rankings required each station to contain NO missing data over the April-June time period for the past 59 or 38 years, depending upon the number of years requested. The values plotted are 1988's ranking as compared to the past 38 or 59 years where 1=maximum value (warmest/wettest) and 59=minimum value (coldest/driest) depending upon the variable desired (temperatures/precipitation). Any station(s) that established a record maximum temperature (rank-1) or minimum precipitation (rank-38 or 59) are listed with the figure. The data consists of only first-order WMO synoptic stations with sufficient history.

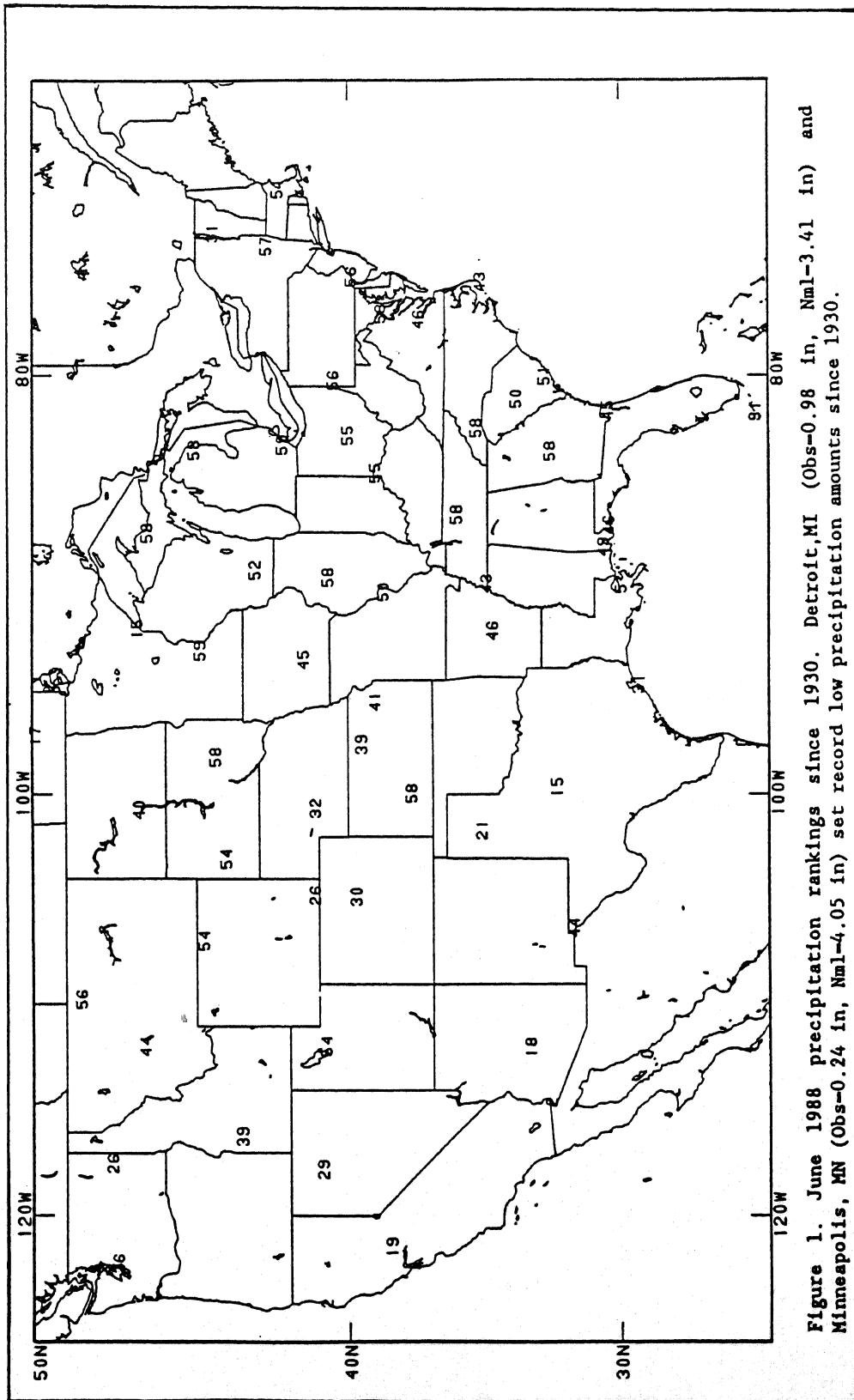


Figure 1. June 1988 precipitation rankings since 1930. Detroit, MI (Obs=0.98 in, Nml=3.41 in) and Minneapolis, MN (Obs=0.24 in, Nml=4.05 in) set record low precipitation amounts since 1930.

Based upon past data, record or near-record dryness during April-June 1988 is situated in the northern Great Plains, Midwest, and Southeast. In June, stations in the East recorded minimal amounts as dry weather expanded eastward from the central U.S. Record warmth covered the northern Rockies and northern Great Plains since 1930, exacerbating the latter region's abnormally dry conditions.

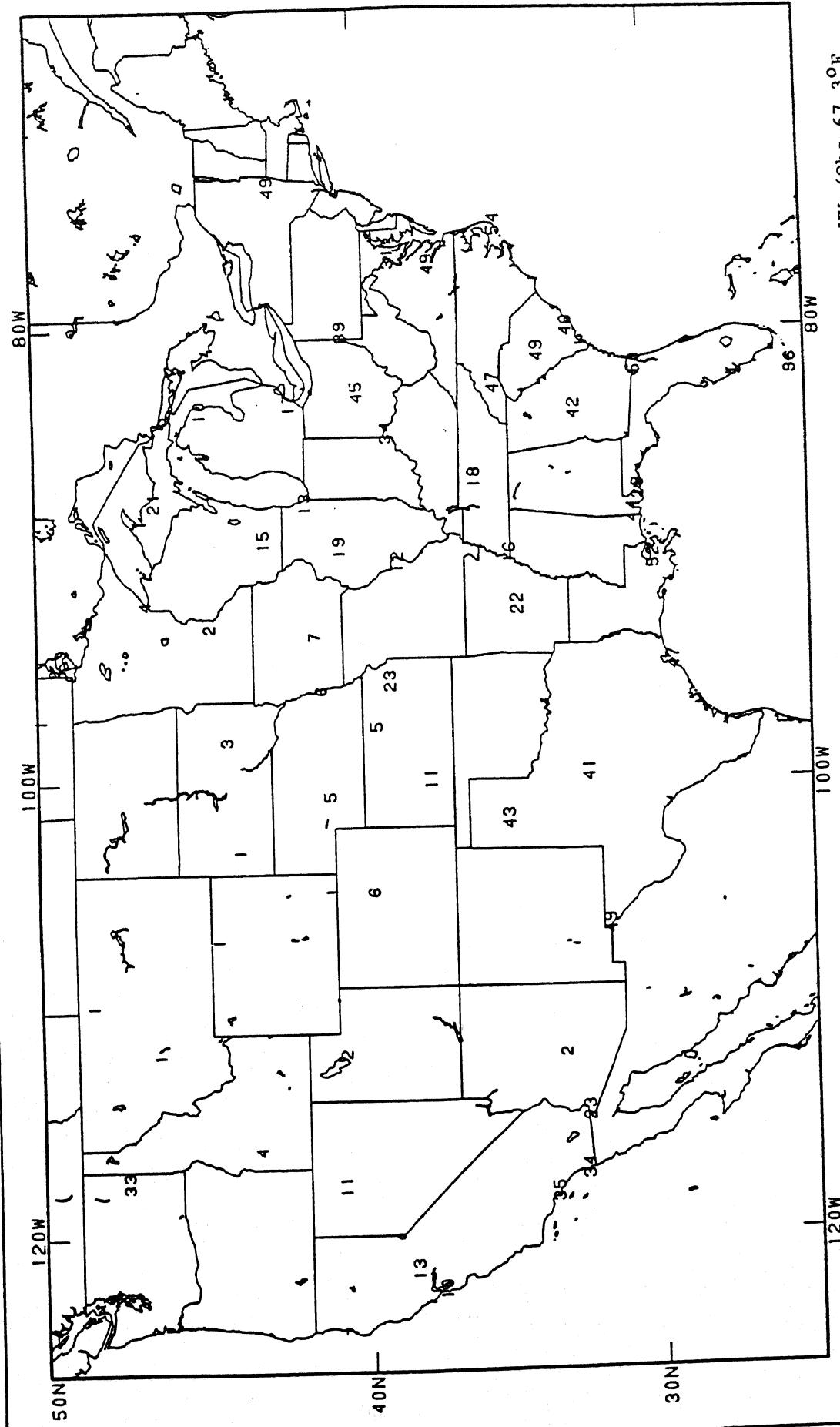
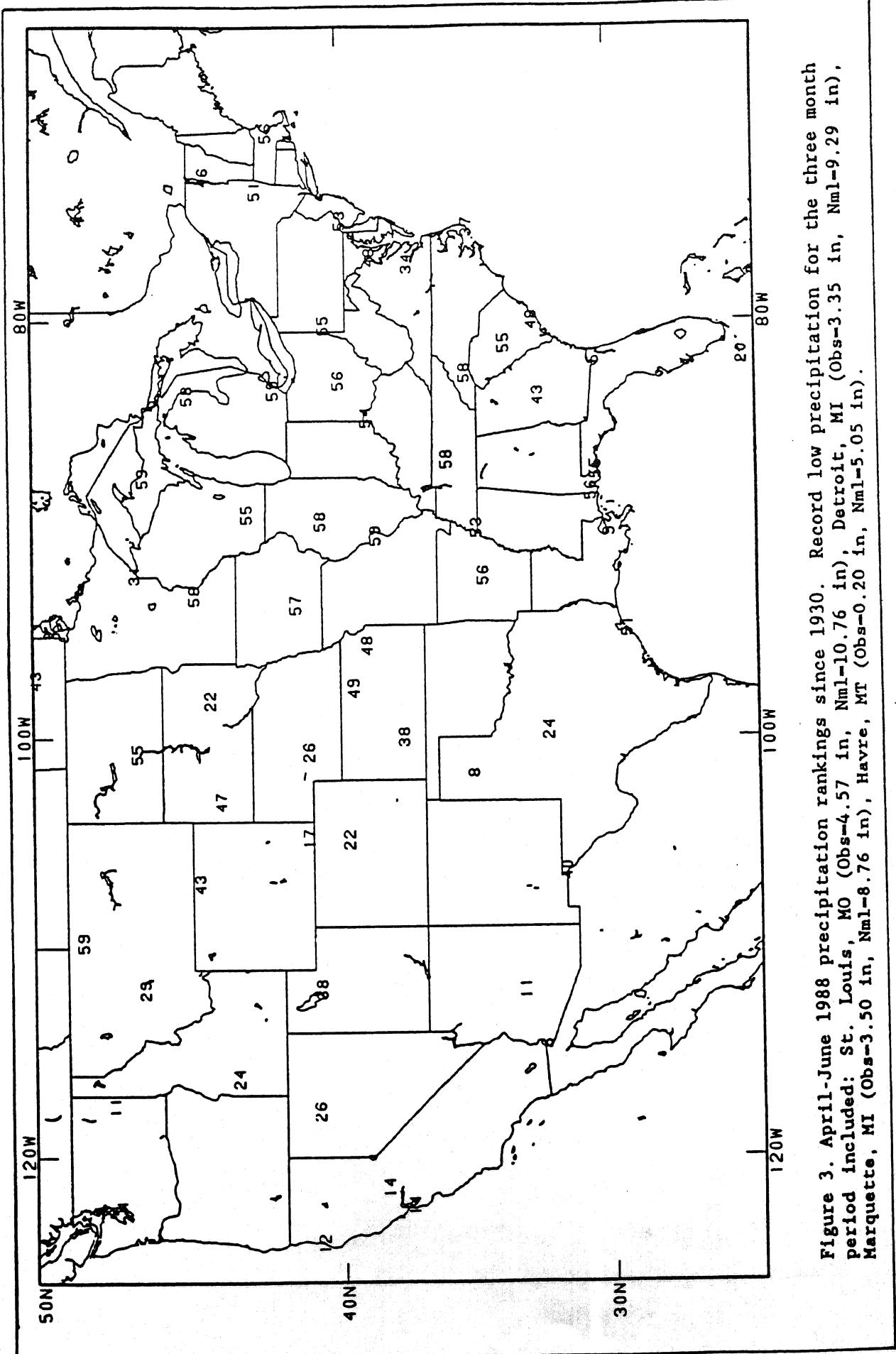


Figure 2. June 1988 temperature rankings since 1930. Record warmth included: Cheyenne, WY (Obs=67.3°F, Nml=61.9°F), Rapid City, SD (Obs=75.7°F, Nml=65.3°F), Sheridan, WY (Obs=74.3°F, Nml=61.7°F), Bismarck, ND (Obs=75.7°F, Nml=61.6°F), Havre, MT (Obs=70.9°F, Nml=60.1°F), Helena, MT (Obs=68.5°F, Nml=64.2°F), and Missoula, MT (Obs=70.9°F, Nml=63.1°F).



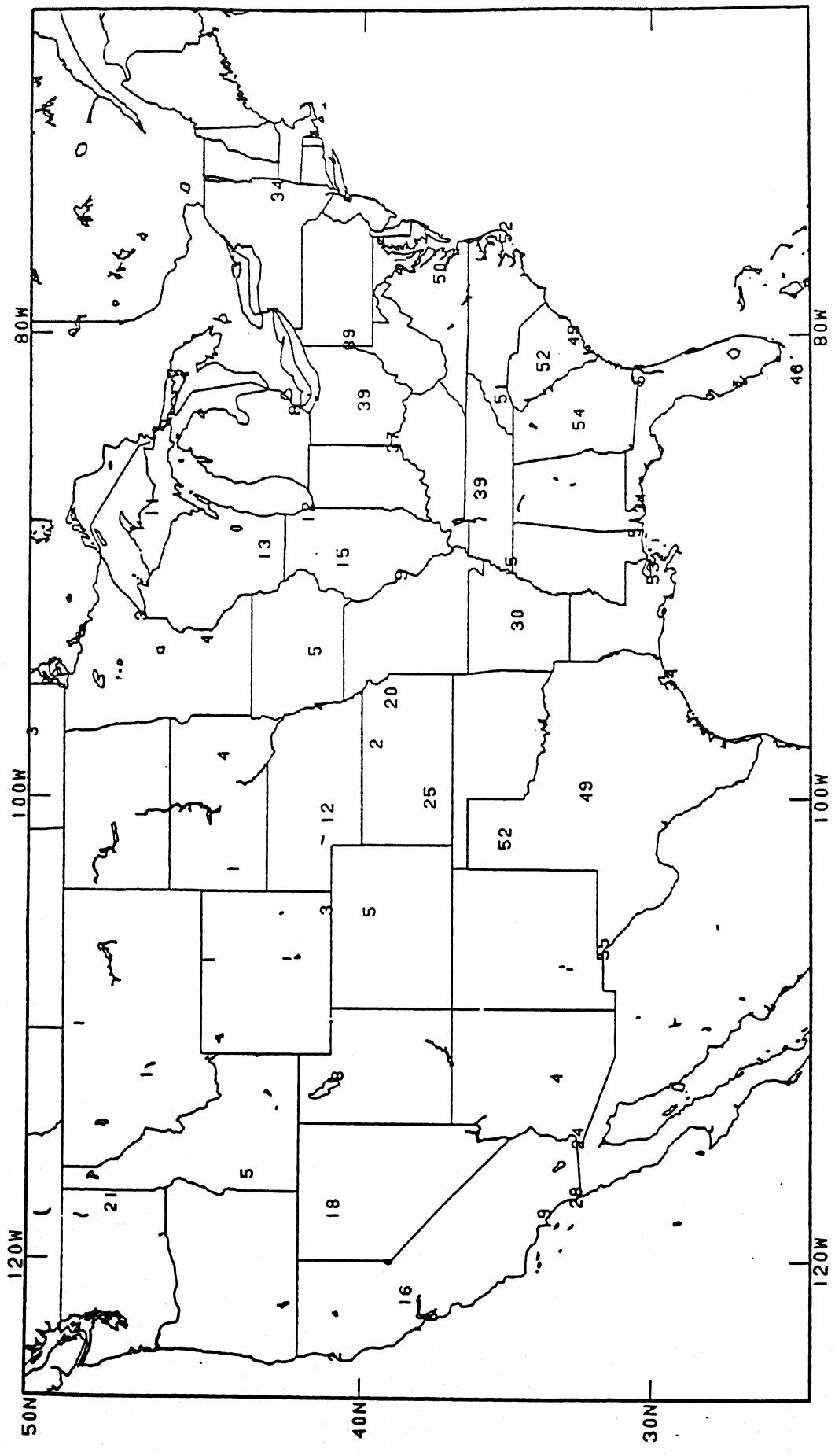
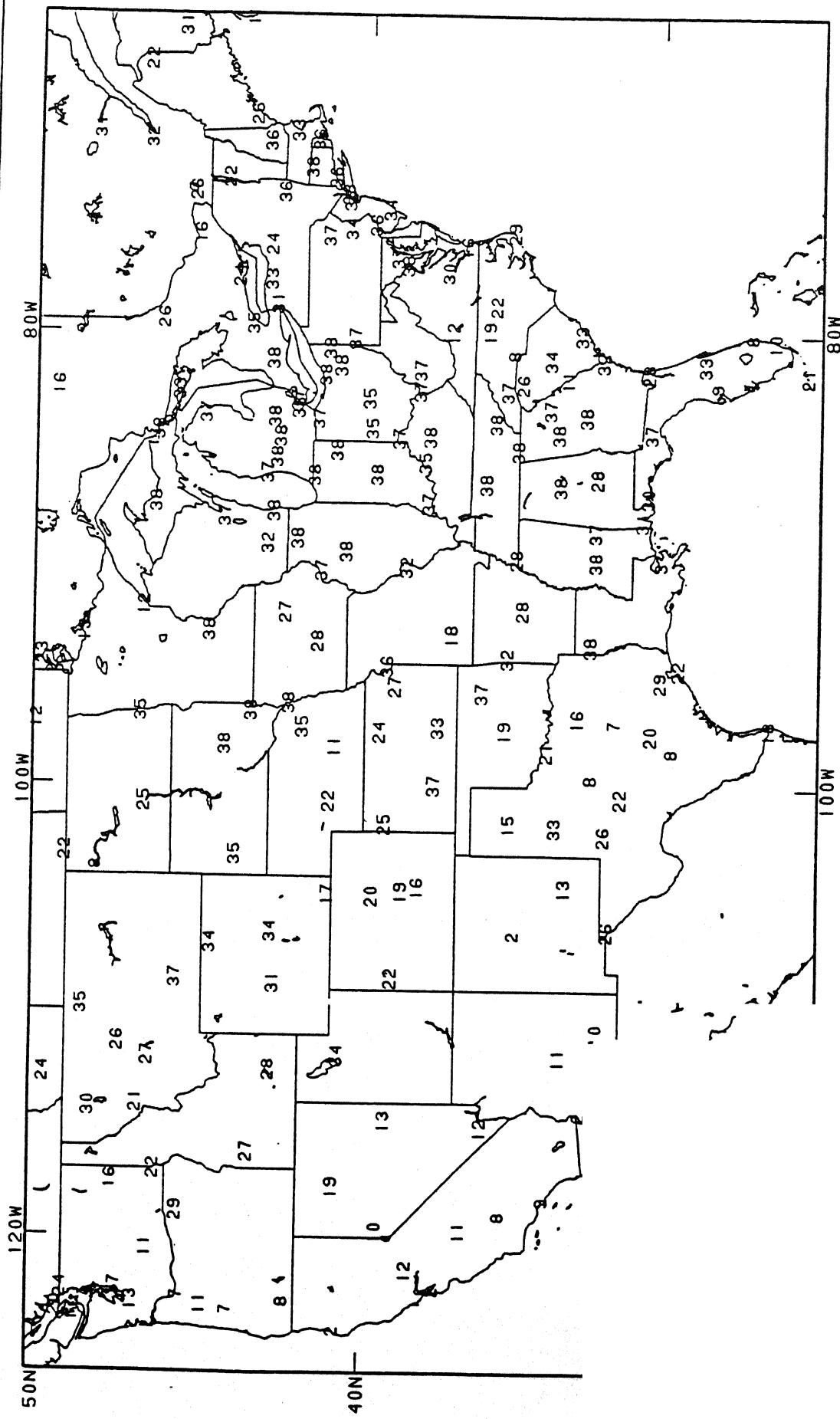
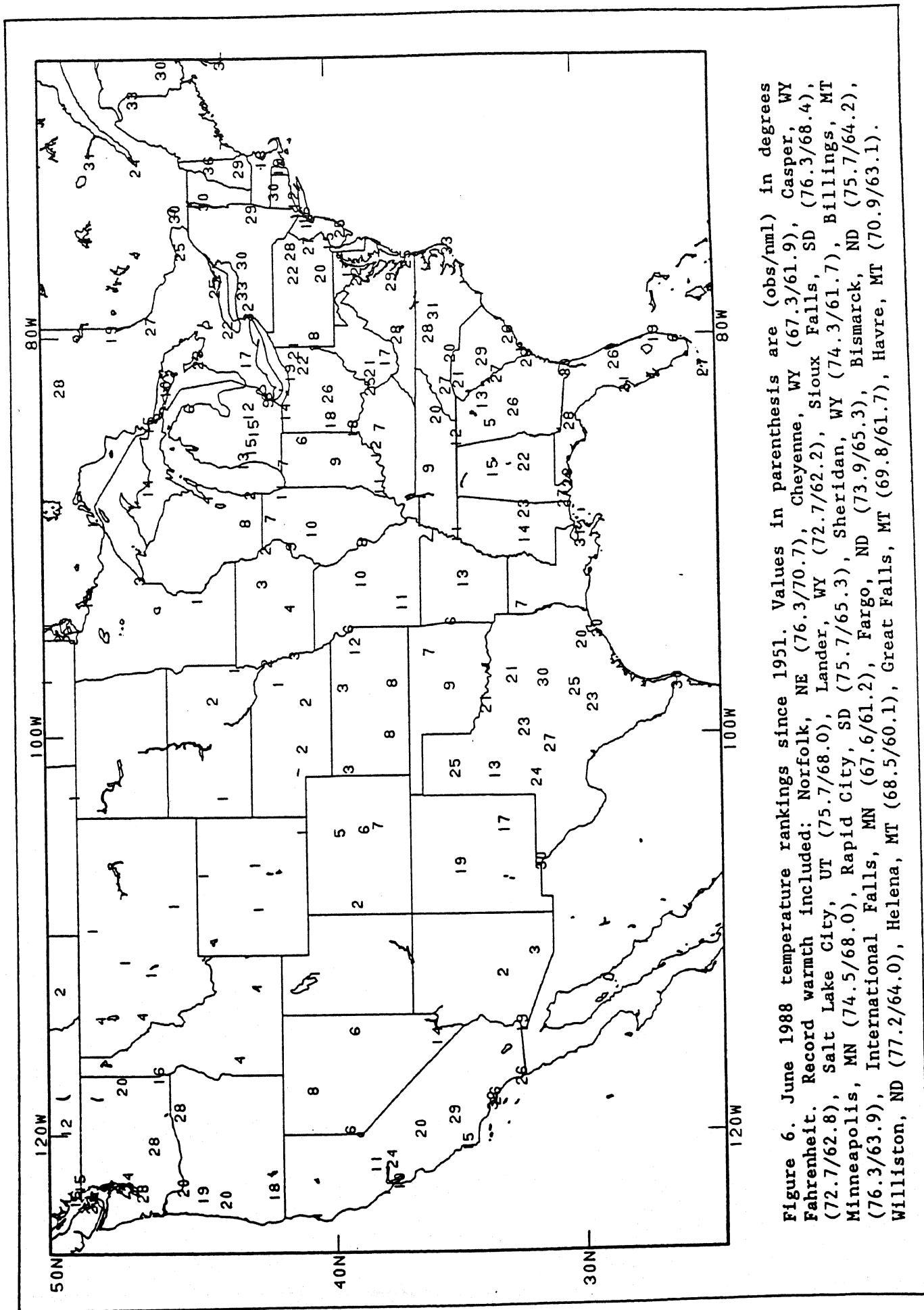


Figure 4. April-June 1988 temperature rankings since 1930. New maximum temperatures over April-June included: Rapid City, SD (Obs=60.9°F, Nml=55.2°F), Sheridan, WY (Obs=59.1°F, Nml=52.5°F), Bismarck, ND (Obs=60.5°F, Nml=53.8°F), Helena, MT (Obs=57.0°F, Nml=51.5°F), Havre, MT (Obs=59.5°F, Nml=53.7°F).



rankings since 1951. Amounts in parenthesis are (obs/nml) in inches.  
 cluded: Macon, GA (0.91/3.73), Atlanta, GA (0.16/3.39), Birmingham, AL  
 ), Shreveport, LA (0.12/3.46), Chattanooga, TN (0.67/3.33), Knoxville,  
 .47/3.67), Washington, DC (0.95/3.33), Lexington, KY (0.63/4.26),  
 York/La Guardia, NY (0.94/3.14), Hartford, CT (0.67/3.36), Akron, OH  
 47), Youngstown, OH (0.67/3.51), Peoria, IL (0.59/3.88), Ft. Wayne, IN  
 3.92). Detroit, MI (0.98/3.41), Lansing, MI (0.20/3.92), Rockford, IL  
 Grand Rapids, MI (0.24/3.66), Flint, MI (0.63/3.21), Milwaukee,  
 .68), Huron, SD (0.75/3.29), Minneapolis, MN (0.24/4.05), Sault  
 [ (0.67/3.29).



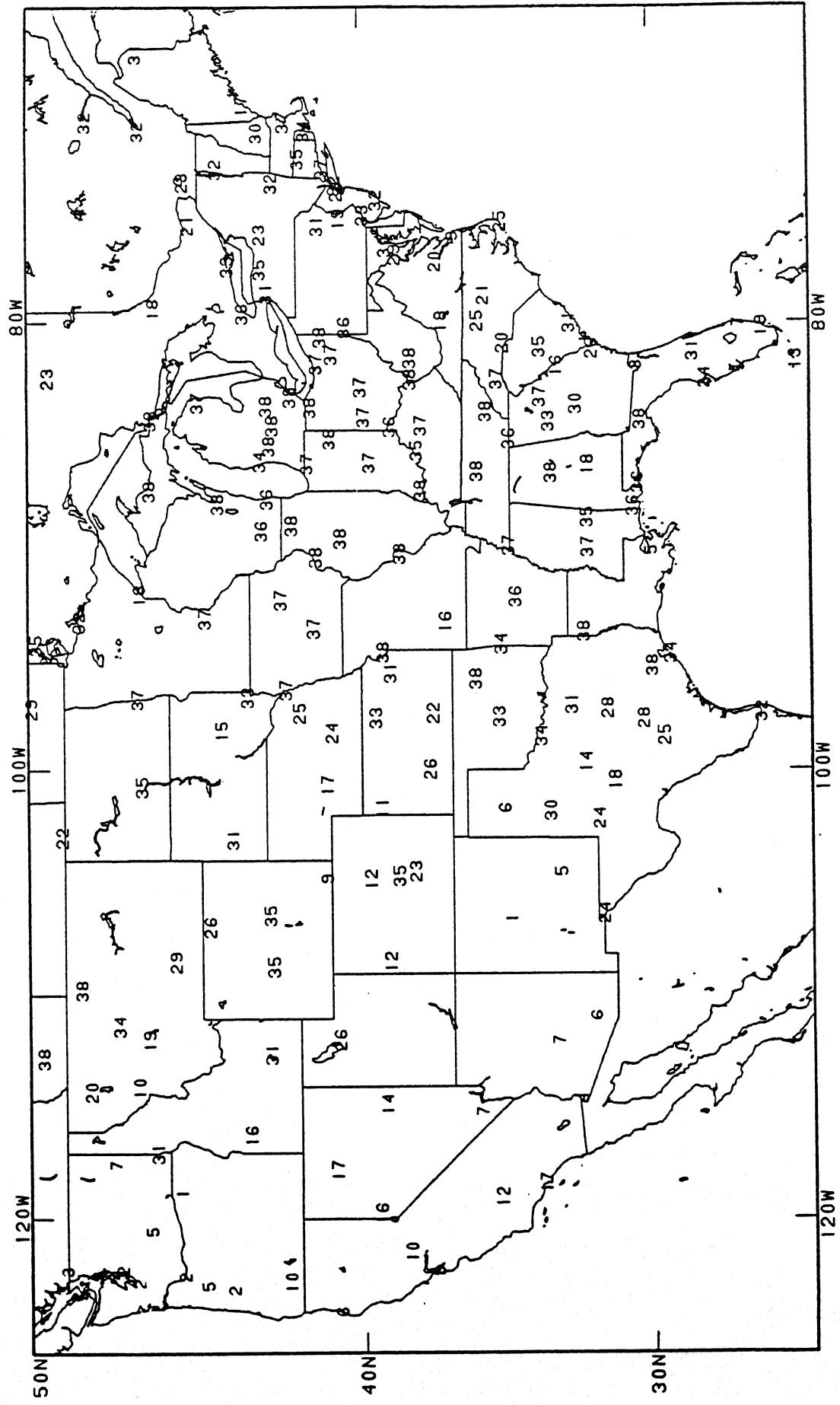


Figure 7. April-June 1988 precipitation rankings since 1951. Values in parenthesis are (obs/nml) in inches. Lowest precipitation amounts over the past 38 years included: Tallahassee, FL (6.42/15.78), Birmingham, AL (4.65/13.08), Houston, TX (4.41/12.94), Shreveport, LA (4.02/12.84), Knoxville, TN (5.28/11.47), Nashville, TN (4.41/12.67), Tulsa, OK (4.96/13.80), Charleston, WV (5.71/10.46), Huntington, WV (5.94/10.80), Evansville, IN (4.17/11.95), St. Louis, MO (4.57/10.76), Indianapolis, IN (5.43/11.28), Kansas City, MO (6.10/12.43), Youngstown, OH (6.50/10.22), Peoria, IL (3.86/11.54), Ft. Wayne, IN (5.47/10.65), Toledo, OH (3.11/9.35), Detroit, MI (3.35/9.29), Lansing, MI (5.08/9.11), Rockford, IL (4.76/12.50), Moline, IL (4.88/12.44), Sioux City, IA (5.51/9.71), Grand Rapids, MI (4.41/10.07), Flint, MI (3.62/9.00), Green Bay, WI (3.27/8.94), Sault Ste. Marie, MI (4.17/8.48), Marquette, MI (3.50/8.76), Havre, MT (0.20/5.05).

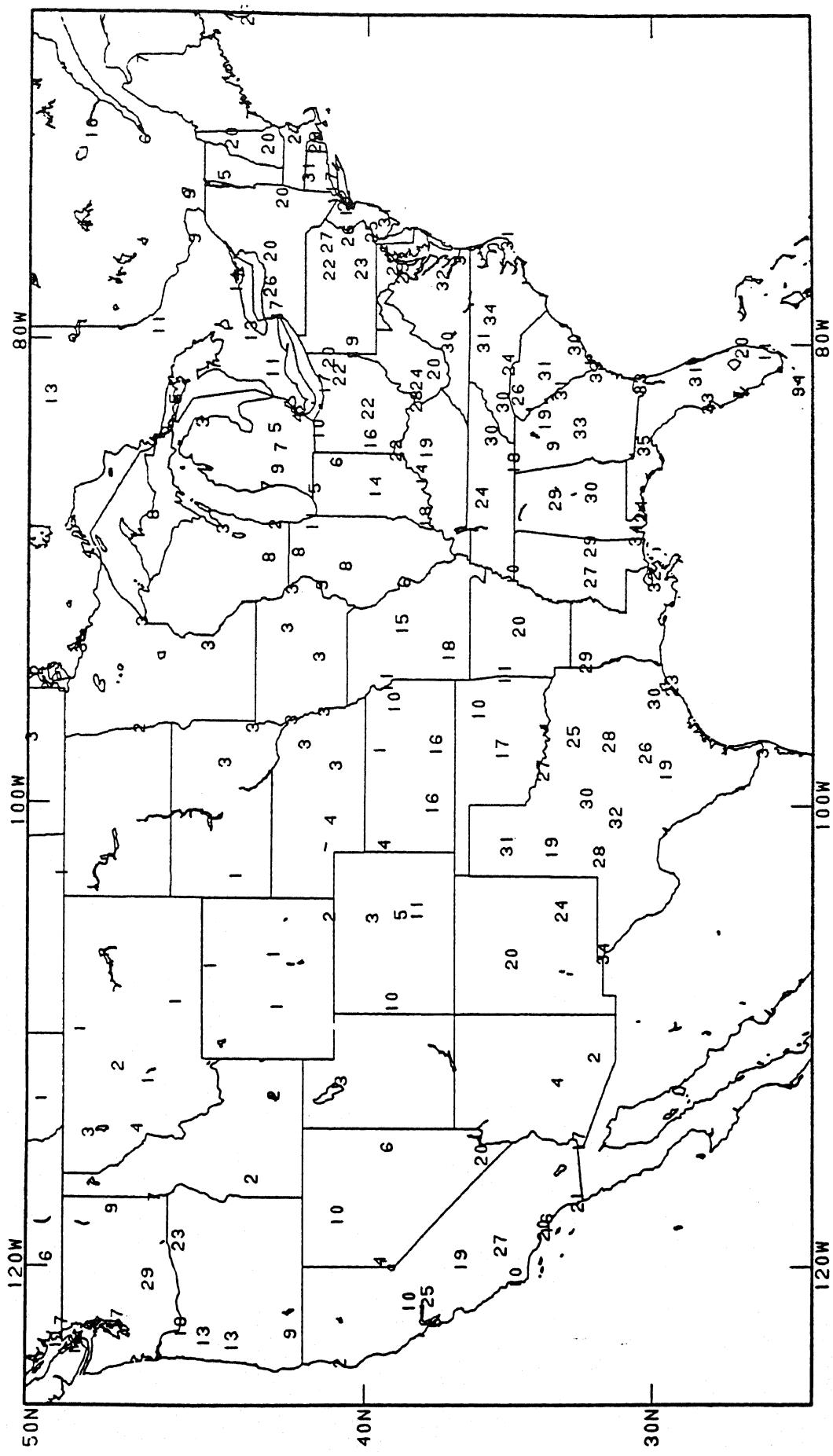


Figure 8. April-June 1988 temperature rankings since 1951. Values in parenthesis are (obs/nml) in degrees Fahrenheit. Record warmth included: Concordia, KS (66.7/63.4), Casper, WY (57.6/52.5), Lander, WY (59.0/52.3), Rapid City, SD (60.9/55.2), Sheridan, WY (59.1/52.5), Billings, MT (61.4/54.4), Bismarck, ND (60.5/53.8), Williston, ND (61.2/53.6), Helena, MT (57.0/51.5), Havre, MT (59.5/53.7).

